WHAT IS CLAIMED IS:

1. A processing apparatus which processes a substrate by a process solution, comprising:

a process container which stores the process solution;

a holding mechanism which holds the substrate in said process container;

an oscillation source which is arranged at a predetermined position in a direction perpendicular to a surface of the substrate held by said holding mechanism to supply an oscillation to the substrate; and

a structure configured to rotate the substrate held by said holding mechanism.

2. The apparatus according to claim 1, wherein said structure is configured to transmit a rotating force to the substrate by a solid member.

3. The apparatus according to claim 2, wherein said structure is configured to rotate the substrate by rotating said holding mechanism.

4. The apparatus according to claim 1, wherein said structure is configured to rotate the substrate by forming a flow of the process solution.

5. The apparatus according to claim 4, wherein said structure is configured to rotate the substrate by forming one of a rotational flow and a vortex flow of the process solution in said process container.

6. The apparatus according to claim 1, wherein said structure has a supply portion which supplies the process solution into said process container to form a flow of the process solution in said process container and is configured to rotate the substrate by the flow of the process solution.

7. The apparatus according to claim 1, further comprising a discharge portion which discharges the process solution to the surface of the substrate to remove bubbles that can be generated in processing the substrate.

8. The apparatus according to claim 7, wherein said discharge portion is configured to discharge the process solution to a local region in the surface of the substrate.

9. The apparatus according to claim 7, further comprising a driving mechanism which moves said discharge portion during processing of the substrate.

10. The apparatus according to claim 9, wherein said driving mechanism is configured to be able to reciprocally move said discharge portion to sequentially inject the process solution discharged from said discharge portion to an entire surface of the substrate.

11. The apparatus according to claim 1, further comprising a mechanism which deaerates the process solution.

12. The apparatus according to claim 1, further comprising a chamber to form a low-pressure environment in a space including at least a portion where the process solution in said process container is exposed.

13. The apparatus according to claim 1, further comprising a chamber to accommodate said process container and form a low-pressure environment around said process container.

14. A processing apparatus which processes a substrate by a process solution, comprising:

a process container which stores the process solution; and

a structure which rotates the substrate by forming a flow of the process solution in said process container.

15. A processing apparatus which processes a substrate by a process solution, comprising:

a process container which stores the process solution; and

a discharge portion which discharges the process solution to a surface of the substrate in said process container to remove bubbles that can be generated in processing the substrate.

16. A processing apparatus which processes a substrate by a process solution, comprising:

a process container which stores the process solution; and

a chamber to form a low-pressure environment in a space including at least a portion where the process solution in said process container is exposed.

17. A processing method of processing a substrate by a process solution, comprising:

an arrangement step of arranging the substrate in a process container which stores the process solution; and

a process step of processing the substrate by the process solution while rotating the substrate,

wherein in the arrangement step, the substrate is arranged while making a surface of the substrate face an oscillation source which supplies an oscillation to the substrate, and in the process step, the oscillation source is operated to supply the oscillation to the substrate.

18. The method according to claim 17, wherein in the process step, the substrate is rotated by transmitting a rotating force to the substrate by using a solid member.

19. The method according to claim 17, wherein in the process step, the substrate is rotated by forming a flow of the process solution.

20. The method according to claim 19, wherein the substrate is rotated by forming one of a rotational flow and a vortex flow of the process solution in the process container.

21. The method according to claim 17, wherein in the process step, the process solution is discharged to the surface of the substrate to remove bubbles that can be generated in processing the substrate.

22. The method according to claim 21, wherein in the process step, the process solution is discharged to a local region in the surface of the substrate.

23. The method according to claim 22, wherein in the process step, the substrate is processed while changing the region of the substrate to which the process solution should locally be supplied.

24. The method according to claim 23, wherein in the process step, the process solution is sequentially injected to an entire surface of the substrate while changing the region of the substrate to which the process solution should locally be supplied.

25. The method according to claim 17, wherein at least in the process step, the process solution is deaerated.

26. The method according to claim 17, wherein the process step is executed while forming a low-pressure environment in a space including a portion where the process solution in the process container is exposed.

27. A processing method of processing a substrate by a process solution, comprising:

an arrangement step of arranging the substrate in a process container which stores the process solution;

and

a process step of processing the substrate by the process solution while rotating the substrate,

wherein in the process step, the substrate is rotated by forming a flow of the process solution.

28. A processing method of processing a substrate by a process solution, comprising:

an arrangement step of arranging the substrate in a process container which stores the process solution; and

a process step of processing the substrate by the process solution while rotating the substrate,

wherein in the process step, the process solution is discharged to the surface of the substrate to remove bubbles that can be generated in processing the substrate.

29. A processing method of processing a substrate by a process solution, comprising:

an arrangement step of arranging the substrate in a process container which stores the process solution; and

a process step of processing the substrate by the process solution while rotating the substrate,

wherein the process step is executed while forming a low-pressure environment in a space including a portion where the process solution in the process container is exposed.

30. The method of any one of claims 17 and 27 to 29, wherein the process step includes a step of etching the substrate.

31. The method according to claim 30, wherein the substrate has a porous region and a non-porous region, and in the etching step, the porous region of the substrate is selectively etched.

32. A method of manufacturing a semiconductor substrate, comprising steps of:

bonding a second substrate to a side of a non-porous semiconductor layer of a first substrate to prepare a bonded substrate stack, the first substrate having the non-porous semiconductor substrate on a porous layer;

processing or fabricating the bonded substrate stack to prepare an intermediate substrate in which the non-porous semiconductor layer is present on the second substrate, and the porous layer at least partially remains on the non-porous semiconductor layer; and

selectively etching the remaining porous layer in the intermediate substrate by an etching step defined in claim 30.